

**ABSTRACT OF THE INVENTION**

A lithium battery with improved safety that utilizes one or more additives in the battery electrolyte solution wherein a lithium salt is dissolved in an organic solvent, which may contain propylene carbonate. For example, a blend of 2 wt% triphenyl phosphate (TPP), 1 wt% diphenyl monobutyl phosphate (DMP) and 2 wt% vinyl ethylene carbonate additives has been found to significantly enhance the safety and performance of Li-ion batteries using a LiPF<sub>6</sub> salt in EC/DEC electrolyte solvent. The invention relates to both the use of individual additives and to blends of additives such as that shown in the above example at concentrations of 1 to 4-wt% in the lithium battery electrolyte. This invention relates to additives that suppress gas evolution in the cell, passivate graphite electrode and protect it from exfoliating in the presence of propylene carbonate solvents in the electrolyte, and retard flames in the lithium batteries.